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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Docket Number (Optional): 0119-171

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on _____

Signature _____

Typed or printed name _____

Application Number	Filed
10/700,855	November 4, 2003

First Named Inventor: Bengt LINDOFF et al.

Art Unit	Examiner
2611	TAYONG, Helene E

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

- ☐ applicant/inventor.
- ☐ assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)
- ☐ attorney or agent of record. Registration number _____.
- ☑ attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34 36075

/Kenneth B. Leffler, Reg. No. 36,075/
Signature

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Typed or printed name

703-848-2332
Telephone number

February 17, 2010
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of _____ forms are submitted.

Patent
Attorney Docket No. 0119-171

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of	)	**MAIL STOP AF**
	)	
Bengt LINDOFF et al.	)	Group Art Unit: 2611
	)	
Application No.: 10/700,855	)	Examiner: TAYONG, Helene E
	)	
Filed: November 4, 2003	)	Confirmation No.: 6321
	)	
For: Interference Estimation in CDMA Systems Using Alternative Scrambling Codes	)	

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In conjunction with the Notice of Appeal filed concurrently herewith, reconsideration and allowance of the above-identified application are respectfully requested for at least the following reasons.

Independent claims 1, 17, and 25 and their related dependent claims 4-11, 16, 18-19, 21-24, and 29 stand rejected as allegedly being obvious over Wang (US 20060154633) in view of Ishikawa et al. (US 7193978 -- henceforth "Ishikawa"). Dependent claims 2-3, 15 and 26 stand rejected as allegedly being obvious over Wang in view of Ishikawa and further in view of Jokinen et al. (US6038238 -- heneceforth "Jokinen"). Independent claim 30 and dependent claims 31-32 stand rejected as allegedly being obvious over Wang in view of Ishikawa and further in view of Langberg et al. (US 5852630 -- henceforth "Langberg"). Each of these rejections is believed to be the result of at least the following clear errors:

- Asserting that Ishikawa discloses "***the terminal*** determining whether ***the terminal*** knows of an empty channelization code m under the alternative scrambling code";
- Failing to show where any of the references discloses "estimating the interference by determining a ***variance*** of symbols in at least two portions of the dedicated channel";
- Failing entirely to address ***any of the features defined by independent claim 17***, and thereby failing to set forth a *prima facia* case of obviousness against this claim and its dependent claims.

These distinct arguments will be expanded upon below after a brief summary of exemplary embodiments of Applicants' invention.

The invention relates to methods and apparatuses for estimating interference in a terminal (e.g., a mobile station or user equipment) in a code division multiple access (CDMA) communication system, in which a pilot channel uses a scrambling code and the terminal uses an alternative scrambling code on a dedicated channel determined by a channelization code. As explained in the specification, beginning on page 3, line 22, good power control calls for the Signal-to-Interference Ratio (SIR) on the Dedicated Physical Channel (DPCH) to be estimated. The interference I, however, is typically estimated using pilot symbols transmitted on the Common Pilot Channel (CPICH), i.e., a channel with large signal strength, and then scaled to the DPCH interference. However, for reasons fully explained in the specification at page 3, line 26 through page 6, line 19, this approach is deficient when alternative scrambling codes are used.

A conventional solution to this problem is to use the DPCH pilot symbols for both signal power (S) estimation and interference power (I) estimation, but this solution has problems. For example the I-estimate is noisy because the number of DPCH pilot symbols is small and the DPCH's overall signal power is small since the DPCH is power-controlled. The noisy I-estimate produces a noisy SIR estimate, and since the SIR estimate directly affects the average needed Base Station (BS) DPCH power, erroneously determining the average power due to the noisy SIR estimate can reduce the system capacity. (See Applicants' specification at page 6, lines 20-26.)

Embodiments defined by independent claims 1 (method), 25 (apparatus) and 30 (computer-readable medium) address this problem. Representative claim 1 defines "A method of ***estimating interference in a terminal*** in a code division multiple access communication system, in which a pilot channel uses a scrambling code and the terminal uses an alternative scrambling code on a dedicated channel determined by a channelization code, comprising the steps of: ***the terminal*** determining ***whether the terminal knows of*** an empty channelization code m under the alternative scrambling code; if the empty channelization code m is ***known to the terminal, then the terminal*** using the empty channelization code m for estimating the interference; and ***if the empty channelization code m is not known to the terminal, then the terminal*** estimating the interference by ***determining a variance*** of symbols in at least two portions of the dedicated channel." (Emphasis added.)

As discussed above, an aspect of the invention involves a terminal determining whether it knows of an empty channelization code. (Such information is typically known by network nodes that make channelization code assignments, such as base stations, but not by terminals.) Thus, to address this problem, embodiments defined by independent method claim 17 practice "*A method of searching for an empty channelization code* m ***in a terminal*** in a code division multiple access communication system." This is discussed further below.

With respect to independent claims 1, 25, and 30, the Office acknowledges that the primary reference, Wang, fails to disclose or suggest at least the following features: (a) the terminal determining whether the terminal knows of an empty channelization code m under the alternative scrambling code; and (b) " if the empty channelization code m is not known to the terminal, then the terminal estimating the interference by determining a variance of symbols in at least two portions of the dedicated channel." The Office relies on Ishikawa as making up for the deficiencies of Wang, so Ishikawa is the primary focus in the following discussion. With respect to independent claim 17, the Office lumps this claim in with independent claims 1 and 25, and consequently fails to provide any arguments about the specific features of claim 17. At least the following clear errors are thus readily apparent.

1. **Neither Wang nor Ishikawa disclose a *terminal* determining whether the *terminal* knows of an empty channelization code m under the alternative scrambling code"**

In both Wang as well as in Ishikawa, it is either a base station (e.g., see Wang at page 3, lines 3-4) or Network Control Apparatus (e.g., Ishikawa Fig. 3 "spread code allocate 208) that is able to know of or otherwise determine whether a scrambling code is empty. However, Applicants' claims define the terminal knowing this. In Applicants' disclosure and claims, as well as in the art generally, the functionality of "terminals" is quite distinct from other nodes (e.g., base stations) in a mobile communication system. For example, the application at page 4, line 16, provides an example of a terminal ("terminal (e.g., mobile station)"), as does the text at page 10, line 15 ("the terminal, or user equipment (UE)"). Moreover, the disclosure uses the term "terminal" in its ordinary meaning in the art. See, for example, page 2, line 3, which defines a "downlink channel" as being "base-to-mobile". (As just shown, the Application also equates "mobiles" as being a type of "terminal.") Keeping in mind that "During patent examination, the pending claims must be given the broadest reasonable interpretation consistent with the specification" (see, e.g., MPEP §2173.05(a), pages 2100-220 through -221 (Rev. 6, Sept. 2007)), the Office must give patentable weight to

the terminal knowing about an empty channelization code. The Office has not done this. The claimed features relating to terminals are lacking in all of the cited prior art, and the Office has failed to provide any rational basis for modifying any of the references to provide the missing features.

2. **The Office fails to show where *any* of the cited references discloses "estimating the interference by determining a *variance* of symbols in at least two portions of the dedicated channel"**

The Office acknowledges that this is lacking in Wang and alleges that this is shown in Ishikawa at "figs 3 and 4, spread code allocations (208) and in fig. 4, chanalization code with use situations 1 for on use and 0 for vacant) to determine whether or not a spread code used for communications can be allocated (fig. 14, col. 19, lines 1-51)" and "In fig. 10, 317 allocation determiner is disclosed that is used to determine first uplink interference electric power and second uplink interference electric power and compared to a threshold (col. 15, lines 19-42)."

Applicants can find no relevance whatsoever in this or any other portion of Ishikawa to Applicants' claimed "determining a variance ...", nor are the cited portions of Ishikawa even part of a process of "estimating interference". Portions of Ishikawa relating to spread code allocation based on table entries (see, Ishikawa at column 12, lines 29-51) have no bearing on determining interference by measuring "a variance of symbols in at least two portions of the dedicated channel." The remaining steps cited by the Office are used by Ishikawa to detect whether radio resources can be allocated, not to estimate interference (see, e.g., Ishikawa at column 4, lines 8-12 which shows distinction between allocating a spread code and allocating radio resources; and Ishikawa at column 15, lines 23-26 which expressly explains how the allocation allowableness/disallowableness determining part 317 determines whether radio resources can be allocated for a circuit.) It is noted that the portions of Ishikawa relied on by the Office assume that interference power is *already known* -- these portions do not themselves show *how* to estimate interference.

3. **The Office fails to address *any* of the features defined by independent claim 17, and thereby fails to set forth a *prima facia* case of obviousness against this claim and its dependent claims**

The Office's arguments lump independent claim 17 in with independent claims 1 and 25, thereby failing to show how each of claim 17's features is disclosed by the prior art of record. Claim 17 is directed to "*A method of searching for an empty channelization code* m

in a terminal in a code division multiple access communication system, comprising the steps of: ***the terminal*** generating an initial interference estimate (I-estimate); ***the terminal*** setting a threshold based on the initial I-estimate; ***the terminal*** *selecting a candidate empty channelization code m*; for the candidate empty channelization code m, ***the terminal*** forming an I-estimate; ***the terminal*** comparing the formed I-estimate to the threshold; and if the formed I-estimate exceeds the threshold, ***the terminal*** *selecting another candidate empty channelization code and repeating the forming and comparing steps*, otherwise ***the terminal*** identifying the candidate empty channelization code m as an empty channelization code." (Emphasis added.) It must be recalled that a "terminal" (e.g., a mobile station or user equipment) is not privy to network-related information, such as which codes have been allocated. (As shown in the cited prior art, network nodes store this information in tables and therefore do not have to "guess" which codes are empty based on interference measurements.) Thus, Applicants' have devised a technique that involves a terminal repeatedly testing different candidates by generating an interference estimate and testing this against a threshold.

The Office Action provides no support for its rejection of independent claim 17, and is therefore *per se* defective. To the extent that the Office considers Ishikawa's disclosure at column 15, lines 19-42 to be of any relevance, Applicants again assert that this portion of Ishikawa does not teach *how* to estimate interference, but rather uses various measures of interference combined with non-interference to decide whether a radio resource can be allocated. Moreover, this and the remainder of Ishikawa are silent with respect to Applicants' claimed repeated testing of candidate spread codes to find one that may be empty.

For at least the foregoing reasons, it is respectfully requested that the various rejections of Applicants' claims under 35 U.S.C. §103 should be reconsidered and withdrawn.

The application is believed to be in condition for allowance. Prompt notice of same is respectfully requested.

Respectfully submitted,

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